The Milltown Reservoir: From Superfund Site to Montana State Park

Diana Hammer
US Environmental Protection Agency
Montana Association of Dam and Canal Systems
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Groundwater Contamination
Cancer Risk from Arsenic

![Graph showing the relationship between Arsenic Concentration in Drinking Water (µg/L) and Lifetime Cancer Risk. The graph includes two curves: Reasonable Maximum Exposure Scenario and Average Exposure Scenario. Key points include the Current Federal drinking water standard for arsenic and the Maximum concentration found in reservoir monitoring well.]
Remediation

- 2004 cleanup plan (Record of Decision)
- Remove the dam and most highly contaminated sediments
- Main Cleanup Goals:
  - Restore the drinking water supply
  - Protect the fishery
  - Provide fish passage
- Story of collaboration and integration:
  The “3Rs” : Remediation/Restoration/Redevelopment
Remediation, Restoration and Redevelopment

- The Milltown ROD integrates the 3 Rs
  - Remediation
  - Restoration
  - Redevelopment
June 2006: Stage 1 begins
Bypass Channel Excavation (photo June 2007)
Stockpiling Sediments (photo June 2007)
Loading Sediments (photo October 2, 2007)
October 2007
Building Clark Fork River Bypass Channel
Bypass channel construction complete
Surface Water Quality Monitoring Locations

Current USGS Monitoring:
- Water Quality Sampling 8 times/year
- Continuous Streamflow
- Daily Suspended Sediment
Public Wells
ESTIMATED TRANSPORT THROUGH MILLTOWN RESERVOIR PROJECT AREA AND RELATIVE CONTRIBUTIONS FROM UPSTREAM SOURCES
(Water years 2006-09)

ESTIMATED ANNUAL SUSPENDED SEDIMENT LOAD (in tons)

For each water year, the total pie area is based on Clark Fork above Missoula.

Water year 2009 represents a rough preliminary estimate of the relative contributions from source areas based on 20 periodic samples collected at each site from March 2 through June 24, 2009.

Clark Fork at Turah Bridge
Blackfoot River
Project Area

2006
97,700 tons

2007
188,000 tons

2008
510,000 tons

2009

97,700 tons
188,000 tons
510,000 tons
ESTIMATED TRANSPORT THROUGH MILLTOWN RESERVOIR PROJECT AREA AND RELATIVE CONTRIBUTIONS FROM UPSTREAM SOURCES

(Water years 2006-09)

ESTIMATED ANNUAL ARSENIC LOAD (in tons)

For each water year, the total pie area is based on Clark Fork above Missoula

Water year 2009 represents a rough preliminary estimate of the relative contributions from source areas based on 19 periodic samples collected at each site from March 2 through June 24, 2009.

**Clark Fork at Turah Bridge**
- 76% (8.60 tons)

**Project Area**
- 16% (1.74 tons)

**Blackfoot River**
- 8% (0.90 tons)

2006
- 11.2 tons

2007
- 16.8 tons

2008
- 27.5 tons

2009

PROVISIONAL INFORMATION; SUBJECT TO REVISION
ESTIMATED TRANSPORT THROUGH MILLTOWN RESERVOIR PROJECT AREA AND RELATIVE CONTRIBUTIONS FROM UPSTREAM SOURCES

(Water years 2006-09)

ESTIMATED ANNUAL COPPER LOAD (in tons)

For each water year, the total pie area is based on Clark Fork above Missoula.

**2006**
- Clark Fork at Turah Bridge: 57% (18.6 tons)
- Project Area: 35% (11.5 tons)
- Blackfoot River: 8% (2.55 tons)

2006: 32.6 tons

**2007**
- Clark Fork at Turah Bridge: 34% (19.7 tons)
- Project Area: 63% (37.0 tons)
- Blackfoot River: 3% (2.03 tons)

2007: 58.8 tons

**2008**
- Clark Fork at Turah Bridge: 14% (27.2 tons)
- Project Area: 84% (157 tons)
- Blackfoot River: 2% (3.22 tons)

2008: 187 tons

**2009**
- Clark Fork at Turah Bridge: 55%
- Project Area: 39%
- Blackfoot River: 6%

2009: Provisional Information; Subject to Revision

Water year 2009 represents a rough preliminary estimate of the relative contributions from source areas based on 19 periodic samples collected at each site from March 2 through June 24, 2009.
Milltown Fish Population

- Milltown Dam blocked fish passage (1908-2008)
- Annually impeded fish passage
  - 11 species
  - 10s of thousands of fish attempting to natal streams, spawning areas during migrations
- Interim fish passage (1999-2006)
  - Only 12% effective
  - Only select species
- Species of interest:
  - Bull Trout (listed species under ESA)
  - Local Trout fishery
  - Northern Pike
Fish Population Monitoring

- Population monitoring
  - Electro-fishing estimates
  - Radio telemetry
  - Conducted at 3 river sections (Clark Fork below Milltown; Clark Fork below the Bitterroot; and the Bitterroot River)

- Based on telemetry, in 2006 and 2007
  - No evidence of fish movement out of the Milltown area
  - High mortality due to high water temperatures and low stream flows

- 2008
  - Significant decline in fish density in Milltown Section from fish migration – not mortality (habitat changes from dam removal activities)

- 2009-2011
  - Evidence of fish redistribution into the Clark Fork stream
  - Fish recovery is occurring
Remediation, Restoration and Redevelopment
Features
- Main Channel
- Secondary Channel
- Point Bar
- Wetland
- Bankfull Floodplain (bankfull elevation to 2 ft. above bankfull)
- Low Terrace (2 to 3 feet above bankfull)
- High Terrace (greater than 3 ft. above bankfull*)
- Existing Floodplain Surface (to remain undisturbed)
- Deer Creek Tributary (pending final design)
- Existing Spring
- Existing Secondary Channel

*Final elevation to be determined based on final cut/fill quantities.
Clark Fork River Diversion
Early May 2011
Remediation, Restoration and Redevelopment

- The Milltown ROD integrates the 3 Rs
  - Remediation
  - Restoration
  - Redevelopment
Milltown Redevelopment Working Group

- Community members
- Asked by the County Commissioners to be on this workgroup in 2003
- Task: Create a vision for the future use of the Site

Q: What do we want once the dam and contamination are gone?
Remediation, Restoration, and Redevelopment
Land Transfer to State

- Land donors:
  - NorthWestern Energy Corporation (land owner)
  - Carpenter’s Union
    - Plum Creek
    - Jacobs family
    - Burlington Northern
  - Nature Conservancy (Legacy Lands)

- This land will be part of the new Montana State Park
  - Approximately 550 acres
Imagining the Restored Area
Milltown Bluff Overlook
Integrated Project Schedule

- 2004  Cleanup Decision
- 2005  Consent Decree Negotiations
- 2005-2006  Planning
- 2006  FERC Transfer of Authority to EPA
- 2006-2007  Infrastructure construction
- 2007  Sediment removal begins
- 2008  Sediment and Dam removal
- 2009  Dam removed; sediment removal complete
- 2010  Remediation, Restoration and Redevelopment
- 2011  Complete Remediation, Restoration
        Continue Redevelopment
- 2012  Remediation and Restoration complete
- 2013  Clark Fork and Blackfoot Rivers open to recreation?
- 2014  Opening of the Milltown State Park?
Questions?
Comments?

Thank you!
Discussion

- If you were head of EPA back in 2000-2004, would you have argued to remove or keep the dam in place? Why?
  - What might the consequences of your decision be?
  - What if you were Atlantic Richfield? NorthWestern? A kayaker? A fly fisher? A spin fisher? A tuber?

- If you were on the Redevelopment Working Group in 2002, what vision would you have had for the Site?

- Has anyone been involved in a dam removal?
  - How was it different? Any similarities?
Discussion

- Has any one been involved in a river restoration project
  - where you tried to restore Nature’s functions?
  - Can you describe, please?

- Were any of you able to watch the dam breach – in person or on the web cam?

- Did this presentation change what you knew or had heard about the Milltown project?
  - If so, how?
  - Now will you look more closely as you drive by Bonner?